CAPTIVE CONCERNS

Health and Management of Captive Elephants in Jaipur

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November 2001

An Occasional Report of a Training Camp conducted by the Wildlife Trust of India
Supported by Help in Suffering, Jaipur and Department of Tourism, Govt. of Rajasthan

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PREFACE

Elephants live in a wide variety of habitats from semi-arid regions to mountains, 10,000 feet in height. But these are really exceptions. Mostly, they prefer deciduous forest and open savannahs, rangelands that abut forest areas and even croplands - all ecosystems characterized by plentiful water and green browse. In captivity, too, elephants need these factors along with social accompaniment and space, to lead a life of comparative well-being.

India has a 4000-year old history of keeping wild elephants and WTI believes that this practice is slowly changing in a manner that a time would soon arise when elephants would not be captive at all. Currently, the Indian scenario is such that elephants in captivity are a reality. What then must we strive for when we look at these captive wild animals? Indeed, the very base parameters that are needed by wild elephants, i. e. space, social structure, green forage and plentiful water. To see captive elephants in Rajasthan, therefore, is extremely painful as both the latter conditions are clearly not met. In Jaipur, over a hundred elephants are used for tourism to take tourists over sun-baked paving stones and tar, up the Amer fort and back. The soft-pads of the forest-dwelling elephant are not comparable to the hard hooves of a camel. Lack of green fodder leads to vitamin deficiencies and both foot and eye ailments plague these animals. The captive health camp that WTI held along with two leading elephant vets from Kerala Dr. Panicker and Dr. Cheeran and the Jaipur based NGO 'Help in Suffering' revealed exactly that. This occasional report is a testimony of what is wrong in captive elephant care in the country.

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Executive Director
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September, 2006
New Delhi

ACKNOWLEDGEMENTS

At the outset, we would like to thank Dr. J.V. Cheeran and Dr. K.C. Panicker for their participation in the program and sharing their valuable expertise on elephant management with the participating veterinarians. This report is an enriched version of their report "Review and Report on Elephant Health Camp" that was submitted to WTI in September 2001.
We thank Cindy Millburn (IFAW's Director AICD), and Rebecca Brimley (Deputy Director, AICD) for appreciating the need to conduct a health camp of this magnitude.

We are indebted to the Rajasthan Tourism Development Corporation for taking care of the accommodation of all resource persons. We greatly appreciate the permission given by Dr. P.K. Mehrotra, Associate Professor, Apex Centre, Jaipur to use his laboratory facilities for parasitological and haematological investigations.

A special mention must be made about the role played by Dr. Sunil Chawla of Help in Suffering (HIS). Being the local contact person, he gave Ms. Bahar Dutt all logistical support.

Mr. Samir Bakshi (Volunteer, WTI) and Dr. Jagjit Purushotham (NDDB, New Delhi) served as volunteers during the camp. Mr. Arvind Krishnan, WTI's Systems Administrator, helped in scanning all the photographs used in this report.

The active participation from the local veterinarians was commendable. Finally, this camp would not have been possible but for the tremendous interest shown by the elephant owners. We appreciate them for turning up in large numbers.

EXECUTIVE SUMMARY

As part of WTI's outreach and training program, a training camp on the health and management for captive elephants was organised in Jaipur from 20th to 23rd of August 2001. The camp was conducted by the Wildlife Trust of India (WTI) in partnership with the Inernational Fund for Animal Welfare (IFAW), in collaboration with a local NGO, Help in Suffering (HIS) and with assistance from Rajasthan Tourism Department and the Elephant Owners' Association of Jaipur.

The objective of the camp was to train local veterinarians in all aspects of elephant husbandry and veterinary care through their active participation in treatment. Elephant owners and mahouts also participated in separate interactive sessions organized for them.

A team of veterinarians, headed by Dr. K.C. Panicker and Dr. J.V. Cheeran, examined the health conditions of 98 elephants. Most of the elephants were found suffering from some ailment or the other. These included heavy parasitism, foot lesions, wounds and abscesses and ocular abnormalities.

Nearly one-third of the elephants had poor body condition. Localized or generalized oedema, a consequence of parasitism and hypoproteinaemia, was observed in 16 elephants. Many of the elephants were also dehydrated and 26 elephants were found to be anaemic. Ocular problems proved to be most distressing of all. Thirty-four of the 98 elephants had problems with their eyes. The most common defect was corneal opacity. Lacerated wounds and/or abscesses were detected in 23 animals. Toe-nails cracks and/or footpad fissures were seen in as many as 30 elephants.

As a prophylactic measure, all animals were dewormed using broad-spectrum antihelminthics. Abscesses were opened and dressed whenever considered essential.

This report suggests prophylactic and curative measures for parasitism, anaemia, deficiencies, foot lesions and corneal opacities. Most of these unhealthy conditions could be prevented by implementing the following recommendations:

1 Comprehensive Elephant Management Program: The elephants in Jaipur need a comprehensive management strategy, the guidelines of which have to be developed.

2 Elephant village: It is imperative that a modern elephant management complex for the 100-odd elephants in Jaipur is built in consultation with experts on enclosure design.

3 Follow up veterinary care: The local doctors who took interest during the camp should be supported and encouraged ideally under supervision by WTI veterinarians, once in 3 months.

4 HIS as nodal agency: HIS could be made the local nodal agency for coordinating the health care of Jaipur elephants.

5 Subsidy: The treatment can be subsidised with the help of the Animal Husbandry Department, or/and NGOs like HIS and WTI.

6 Involvement of others: The owners and mahouts should be involved in all aspects of elephant management: including the design of the Elephant Village, and the management plan.

7 Elephant insurance: The insurance authorities should insist on Modern Veterinary Care and ask for a health certificate from a Registered Veterinary Practitioner.

1. INTRODUCTION

India is home to about 27,000 elephants in the wild and about 5000 elephants in captivity. The captive elephant population could be broadly categorised into two groups:

(i) those residing in elephant camps in forest areas, owned and managed by the forest department, and
(ii) those living in urban and suburban environs, owned privately by individuals, trusts and societies.

Many of these captive elephants, particularly those under the custody of private ownership, are poorly managed. Ironically, these elephants are the source of livelihood for many of the owners. Most of these elephant owners believe in and practice traditional medicine and are, therefore, less inclined to recognize or accept modern practices in allopathic medicine.

1.1 Elephants of Jaipur

Though wild elephants are not found in Jaipur, captive elephants have been brought here from different parts of India. Jaipur perhaps has the largest number of privately owned elephants in India. These elephants have been traditionally used for tourism purposes in Jaipur.

In the past, important personalities of the British Raj and the maharajas arranged elephant rides for their guests up to the Amer palace. Rajasthan Tourism revived this tradition by including the Elephant Festival in its cultural calendar. The present-day pageant that originated only a decade ago, was specifically devised with the tourist in mind.

1.2 Health Camp

Help in Suffering (HIS), an NGO based in Jaipur, contacted WTI in April 2000, for organizing a health camp for the 100-odd elephants in their city. As a part of WTI's outreach and training program, WTI in partnership with IFAW, accepted their request and organized an elephant health and management training program in Jaipur for four days, between 20th and 23rd August 2001. The local hosts included Help in Suffering (HIS), Rajasthan Tourism Department and the various elephant owners' associations. Though the camp was mainly intended for veterinarians, special interactive sessions were also organized for elephant owners and mahouts.

2. METHODS

2.1 Resource Persons

Dr. J.V. Cheeran and Dr. K.C. Panicker, heading the departments of Pharmacology and Parasitology respectively, at the Trissur Veterinary College in Kerala, were the main resource persons for the training camp. They have more than 20 years of experience in the care and management of captive elephants in Kerala. WTI veterinarians, Dr. Anand Ramanathan and Dr. N.V.K. Ashraf were the supporting vets.

WTI was also represented by Vivek Menon, Executive Director, who delivered a lecture on wildlife law, Bahar Dutt, who liaisoned with the local hosts and Urvashi Dogra, Communications Manager.

2.2 Venue

The inauguration and lectures were held at the Rajasthan Tourism Department Corporation's Hotel on M.I. Road, Jaipur. The second, third and fourth day's programs were held at Amer Fort grounds. The second

session on the last day was spent at the Apex Veterinary Diagnostic Centre in Jaipur.

2.3 Program

Theory: The first day (20th August, 2001) was devoted to inauguration, lectures on elephant husbandry and health care, slide shows on diseases that afflict elephants and interaction with mahouts and elephant owners.

Clinical examination: The second, third and fourth days (21st to 23rd August) were utilized for clinical examination of all the elephants present at the camp. The second day began with an exercise on Body Condition Evaluation (BCE) of elephants. Simultaneously, the participating veterinarians were also taught elephant morphometry and indirect methods to estimate the age.

Laboratory: The second session on the last day was designated for examining faecal and blood samples collected from different animals at the Apex Centre, Jaipur.

2.4 Participants

The participants included veterinarians, elephant owners and mahouts. More than 40 veterinarians participated in the camp (Annexure: 1). Elephant owners and mahouts from six different elephant welfare associations also participated in the training program.

2.5 Inauguration

The training camp was formally inaugurated on the 20th morning by Mr. Upadhyay, Director, Rajasthan Tourism Department. Those who spoke on the occasion included:

-Dr. U.K. Thanavi, Director, Animal Husbandry Department
-Mr. R.H. Upadhyay, Director, Rajasthan Tourism Department
-Ms. Christine Townsend, Managing Trustee, HIS
-Dr. K.C. Panicker, Consultant veterinarian, Thrissur, Kerala
-Dr. J.V. Cheeran, Consultant veterinarian, Thrissur, Kerala
-Mr. Vivek Menon, Executive Director, WTI

2.6 Media Coverage

The press evinced a lot of interest in the workshop and covered it extensively. The Times of India, Delhi carried an anchor story on the front page on 20th August, 2001. Other leading English newspapers, such as The Indian Express, The Hindustan Times, The Asian Age, The Pioneer and regional papers like Dainik Navjyoti and Rajasthan Patrika carried articles about the health camp.

A number of publications also assigned their representatives from Delhi to cover the event. Reuters News Agency sent its chief photographer, while Tehelka.com had a senior correspondent. TV channels like Aaj Tak, Eenadu TV, Bhaskar TV, Sahara TV also covered the health camp and interviewed Dr. J.V. Cheeran, Dr. K.C. Panicker, and Mr. Vivek Menon.

2.7 Course Material

All participating veterinarians received a copy of the course material. The course material, compiled from articles contributed by Dr. Cheeran and Dr. Panicker, contained information on all aspects of elephant husbandry, health care and management. Select contents of the course material have been listed in Annexure II.

Articles of relevance on the day-to-day management of elephants were specially translated into Hindi as handouts for mahouts and elephant owners.

2.8 Lectures and Presentations

Audiovisual supports, including an overhead projector and a slide projector made the presentation lively. The participants also actively participated in the deliberations.

Wherever essential, Dr. T. M. Ramchandani, Assistant Director of Veterinary Polyclinic in Jaipur, translated some of the lectures given by Dr. Cheeran and Dr. Panicker into Hindi for the benefit of elephant owners and mahouts. They covered the following topics in different sessions:

Session 1.

- General anatomy of elephants
- Signs of health
- Infectious diseases of elephants and their treatment
- Non specific diseases

Session 2.

- Anaesthesia of elephants
- Drugs and dosages in elephant treatment
- Management of musth in elephants
- Elephant reproduction

Session 3.

- Care and handling of elephants by mahouts
- Tethering sites in elephants
- Bathing and grooming
- Care of pregnant elephants

Session 4.

Dentition in elephants
Growth and age factors
Elephant nutrition
Feeding and fodder schedules

2.9 Laboratory Investigations

The facilities at the Apex Centre (diagnostic laboratory) of the Agricultural University and Help in Suffering were used for processing and examining clinical materials like faeces and blood. While blood samples were collected from all the elephants examined, faecal samples were collected from a select number of 14 elephants. Blood samples were collected in both plain vacutainers with no preservatives and in vacutainers containing preservatives (EDTA).

The faecal samples were examined for presence of parasite ova using the standard floatation technique. The serum separated from the blood samples is being preserved for serological tests against infectious diseases like FMD.

3. RESULTS OF CLINICAL EXAMINATION

Overall 98 elephants were assessed for their health condition (Appendix III). A wide range of data was collected from every animal as listed in Appendix IV:

The results of the examination are presented in Table 1. Most of the animals were suffering from heavy parasitism, anaemia, deficiency related diseases, and foot lesions. Corneal opacity was the most significant defect noticed during the examination.

Table1: Prevalence of major anomalies and disease conditions (N=98)

Helminthiasis	~ 84
Foot lesion	53
Reports of Mud Eating	11
Oedema on neck & belly	7
Blind - both eyes	7
Blind - one eye	8
Opacity - both eyes	6
Opacity - one eye	14
Temporal swelling, both sides	2
Temporal swelling, one side	2
Swelling on elbow region	5
Anaemia & Dehydration	26
Lesion on tongue	1
Ulcerating wounds	6
Skin abnormalities	9
Broken tusk	1
Prolapse of genitalia	1

3.1 Body Condition Evaluation

The body condition of almost every animal examined was recorded. The condition was judged based on the degree of protuberances of bony processes and the extent of concavity of natural depressions in the body.

Of the 52 animals examined for body condition, 13 (25%) were in `good' physical condition and 23 (44%) were designated in `fair' category. The remaining 31% were in `poor' physical condition. The flank and temporal area depressions in these animals were very marked and the intercostal depressions were very pronounced.

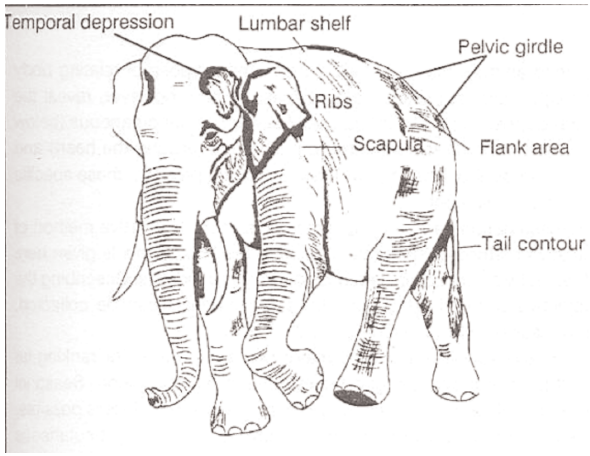


Figure 1: Key areas for elephant body condition evaluation

3.2 Musth

Only nine of the total 98 elephants presented in the health camp were males. Of these, four were tuskers and five were makhnas. Males are probably deliberately avoided to avoid management problems arising due to musth. Surprisingly, most of the owners reported no incidence of musth in their animals during the previous five years.

Table 2: Incidence of musth

S.No.	Reg.No.	Animal name
1	79	Ramu (No musth for the last 5 years)
2	-	Lakshmiprasad (Musth not seen for previous 5 months)
3	24	Amarbahadur (Musth annually 3 months from December)
4	3	Musthana (Musth occurs annually in April-May)
5	61	Gangaprasad (No musth for the last 14 years)
6	39	Bhola - Makhna (No musth for the last 15 years)

3.3 Parasitism

Most of the animals were suffering from heavy parasitism. This was evident from the 14 faecal samples collected for examination. Parasite ova of Amphistomes and Strongyles could be detected from 12 of these faecal samples. Some of these samples showed mixed infection. Mud eating, a behavioural consequence of heavy parasitism, was also reported (Table 3). Many of the animals were found to be anaemic, also a consequence of heavy parasitism (Table 5). Another characteristic sequel of parasitism and hypoproteinaemia is localized oedema (Table 4). Because of the anatomical position of the head and the jaw in elephants, oedema is seen often at the dependent parts like brisket and belly.

Table 3: Incidence of mud eating reported by elephant owners

S.No.	Reg.No.	Name of Animals
1	144	Chanchal
2	130	Chambhakali
3	116	Roopa
4		Lakshmiprasad
5	107	Bihithi
6	101	Madhumala
7	32	Chandini
8		Rani
9	89	Lakimala
10	30	Lakshmi
11	15	Gulabkali

3.4 Dehydration

There is severe shortage of water and many of the elephants examined were found to be dehydrated. Hence a water trough for drinking water and an artificial pond for giving a bath and scrub for elephants have to be

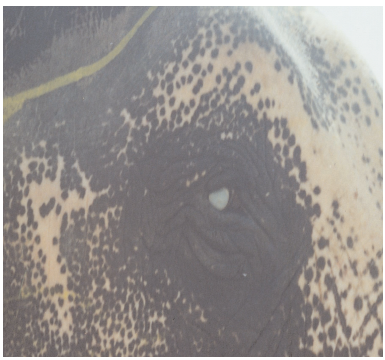
provided as a common amenity. The Government of Rajasthan may take this important lead with support of elephant owners.

3.5 Eye problems

The most striking non-infectious disease condition was corneal opacity. More than one third of the elephants examined (i.e. 34 of the 98 examined) had problems with at least one eye. In some cases the lens was involved, resulting in total blindness and sunken eyeballs. The tallest

Normal eye

Beginning of cataract



Total blindness

Figure 2: Ocular problems in elephants examined

Table 4: Number of animals with oedema (generalized & localised)

S.No.	Reg.No.	Name of the Animals	Region
1	125	Phoolmala	On the neck
2	124	Chanchal	All over the body
3	115	Chanchal	Lower abdomen, neck
4		Lakhy	On neck
5		Lakshmi	Bilateral on lower abdomen
6		Rani	Generalised oedema & on neck
7	49	Lakhy	Slight on the lower abdomen
8	36	Chanchal	Temporal region - bilateral
9	64	Kali	- do -
10	64	Gulabkali	Temporal region - unilateral
11	98	Lakshmimala	- do -
12	125	Phoolmala	Rt. Elbow
13	66	Chambhakali	Both elbows
14	43	Shyama	Rt. Elbow
15	132	Roopa	Both elbows
16	93	Pavankali	Capped elbow

elephant of Jaipur, a makhna exceeding 9.5 feet in height, was totally blind. Overall, six elephants had lost vision in both eyes, eight elephants had only one functional eye, in six cases both eyes were partly affected and in 14 cases one of the eyes was affected (Table 6: a,b,c).

Case histories revealed that most of the elephants had normal vision on arrival to Jaipur but soon developed symptoms of cataract or other types of ocular abnormalities. To cite an example, the elephant Lakshmi (Reg. No. 69) belonging to Mr. Javed Khan had normal eyes when it was

Table 5: Animals found to be anaemic and dehydrated

S.No	Reg.No.	Name
1	114	Chanchal
2	66	Chambhakali
3	126	Bijily
4	79	Ramu
5	29	Anarkali
6	41	Gulabkali
7	108	Lakshmi
8	51	Lakshmi
9	65	Gulabkali
10	-	Lakshmiprasad
11	43	Shyama
12	38	Sundar
13	-	Chanchal
14	3	Masthana
15	93	Pavankali
16	106	Rani
17	112	Lakshmi
18	20	Bijily
19	48	Moothy
20	89	Lakhimala
21	30	Lakshmi
22	78	Chamba
23	39	Bhola
24	31	Reeka
25	15	Gulabkali
26	22	Chamba

purchased three years ago. Inadequate green foliage resulting in Vitamin A deficiency is the likely cause for such a high prevalence of opacities.

Corneal opacities are not uncommon in elephants. Though it has been observed occasionally among captive elephants maintained by the forest departments, the prevalence is not to the extent seen in these animals

Table 6: Ocular abnormalities in the elephants examined

a) Eyes-total blindness-bilateral

S.No.	Reg.No.	Name of Animals
1	94	Dilrupa
2	87	Rani
3	69	Lakshmi
4	3	Musthana
5	5	Madeena
6	112	Lakshmi

b) Unilateral blindness

S.No.	Reg.No.	Name of Animals
1	36	Chanchal (Lt.eye, Rt.eye partial)
2	67	Kali (Lt. & Rt. eye partial)
3	-	Madhubhala (Lt. Eye)
4	-	Jamuna (Lt.Eye)
5	60	Rajbhahadur (Lt. Eye)
5	27	Jamuna
7	43	Shyma
8	62	Khali

c) Corneal opacity-Unilateral

S.No.	Reg. No.	Name of Animals
1	9	Dhilrupa (right eye)
2	6	Lakshmi (right eye)
3	26	Lakshmi (left eye)
4	79	Rani (left eye)
5	29	Anarkali (left eye)
6	96	Kajel (left eye)
7	24	Amarbhahadur (right eye)
8	9	Chanchal (left eye)
9	81	Anarkali (right eye)
10		Jamuna (right eye)
11	61	Gangaprasad (right eye)
12	85	Radha (left eye)
13	89	Lakhimala (left eye)
14	32	Chandini (right eye)

d) Corneal opacity-Bilateral

S.No.	Reg. No.	Name of Animals
1	41	Gulabkali
2		Chanchal
3		Roopkali
4	30	Lakshmi
5	14	Boby
6	15	Gulabkali

3.6 Abscesses and Ankush Injuries

Abscesses are not uncommon in captive elephants that are not properly managed. Many of the elephants had multiple abscesses on the body. Of the 98 elephants examined, 23 had some wound or the other. The most common wounds were ulcerating wounds (Table 7), abscesses in the temporal region, elbows, hind legs and ankush injuries at the ear base. In many cases, what began as bedsores had become infected into serious abscesses. The caudal fold was torn in most of the elephants examined (Figure 3). In five of these cases, the wounds had become infected and had developed into abscesses.

Table 7: Cases with ulcerating wound

S.No.	Reg.No.	Name
1	9	Dhilrupa (on brisket)
2	114	Chanchal (below right knee)
3	108	Lakshmi (outside elbow, rump)
4	11	Jangbhahadur (wound on the right hind leg above knee)
5	65	Gulabkali (upper side of tail)
6	3	Musthana (right eye)

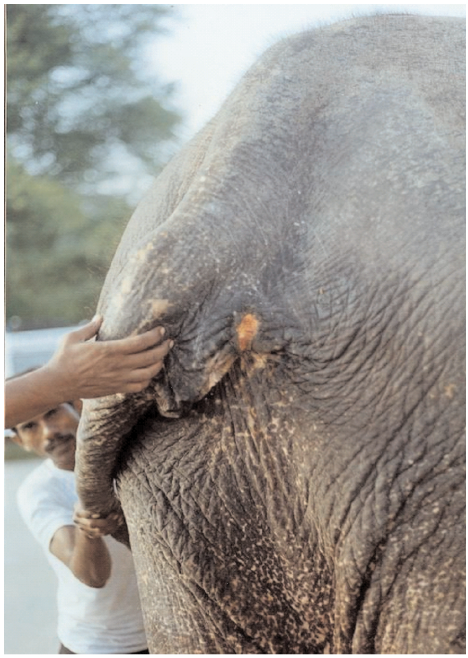


Figure 3: Lacerated wound on tail base

3.7 Footpad Fissures and Toe-nail Cracks

Elephants being digitigrades, the entire body weight is borne by the toes. The sole acts like a slipper and is prone to wear and tear. While an overgrown excess sole is a problem in zoo elephants, worn-out soles are a problem in over-worked captive elephants. Unlike elephants inhabiting high humidity areas like forests, most of the elephants in Jaipur had worn out footpads (Table 8). Most of the animals also had toe-nail cracks. These cracks, if

Figure 4: Normal footpad (left) and infected footpad (right)

Table 8. Incidence of foot pad cracks and fissures

S. No.	Reg.No.	Name of Animals
1	64	Gulabkali
2	94	Rajarani
3	121	Chanchal
4	104	Rasheed (Makkana)
5	125	Phoolmala
6	86	Lakshmi
7	66	Chambakali
8	26	Lakshmi
9	109	Pinky
10	130	Chambakali
11	29	Anarkali
12	41	Gulabkali
13	108	Lakshmi
14	96	Kajel
15	11	Jangbhahadur
16	119	Lakshmi
17	122	Chanchal
18	121	Madhubala
19	36	Chanchal
20	65	Gulabkali
21	67	Kali
22	107	Bihithi
23	43	Shyma
24	74	Anarkali
25	24	Amarbhahadur
26	115	Chanchal
27		Jamuna
28	132	Roopa
29	3	Masthana
30	93	Pavankali
31	135	Rajkali
32	20	Bijily
33	107	Rani
34	60	Rajbahadur
35	105	Kajel

S.No.	Reg.No.	Name of Animals
36	90	Roopkali
37		Rani
38	48	Moothy
39	85	Radha
40	89	Lakshmimala
41	30	Lakshmi
42	99	Moothy
43	131	Roopa
44	39	Bhole (Makkana)
45	77	Anarkali
46	117	Roopa
47	102	Guljeri
48	68	Mayavathy
49	31	Reeka
50	14	Booly
51	15	Anarkali
52	113	Munna
53	32	Chandini

not properly managed, may lead to pododermatitis. The extent of wear on the footpads were categorised into slightly, moderately and severely worn out pads. More than 30% of the elephants had severely worn out pads. Nearly 50% of them had near-normal footpads with only a few fissures.

The high incidence of footpad erosion could be due to dry climatic conditions in Jaipur. As Jaipur is a low humidity area, it would demand a greater attention to foot care.

3.8 Miscellaneous Conditions

Other abnormalities recorded during the camp included pustules on the tongue, lameness, vaginal prolapse, damages to trunk etc. Two cases of pseudo-pregnancies were also recorded.

Two of the tuskers had broken tusks. One of these elephants had an infected pulp cavity; the gangrenous tissue and pus could be removed from the cavity by long forceps.

Table 9: Miscellaneous conditions

S.No.	Reg.No.	Name
1	36	Chanchal (Prolapse of vulva)
2	54	Chambhakali (Left hind slight limping)
3	-	Lakshmiprasad (Left trunk torn, pus oozing)
4	77	Anarkali (right portion of trunk hot and left cold)
5	102	Gulzar (Delivered six months back)
6	6	Lakshmi (pustules on the tongue)

4. SUGGESTED PROPHYLAXIS AND TREATMENT

Actual treatment, such as opening of the abscesses, dressing and administration of drugs had to be restricted to important cases considering the sheer number of animals to be examined in three days. For most cases, the local veterinarians were instructed to follow up the cases. A general treatment schedule, prescriptions and guidelines for veterinarians have been given as follows:

Figure 5: Pustules on the tongue of an elephant

Figure 6: Infected pulp cavity

Parasitism

Majority of animals showed the presence of strongyles and amphistomes. Some showed mixed infection. Since all the animals congregate in a small area during the season, cross and mixed infection is very likely. Hence, repeated treatment will be required.

Periodical faecal examination will not only improve the skill of our local vets, but also give an authenticity to the treatment, and better compliance of recommendation. The current anthelminthics used in veterinary practice are very safe and act against a broad spectrum of helminths.

Anaemia

Parasitism leads to blood loss and anaemia, as well as periodicoedema due to hypoproteinaemia. Hence, haematinics other than commercial preparations can also be given. The daily requirement of iron for elephants is 157 mg/kg body weight. This would mean 1.5 gms. of iron will be required per ton of elephant per day. Since Ferrous sulphate contains nearly 30% of iron, it will meet this demand for an adult elephant i.e. 4.5 gm/ton. Animals also have some access to iron through feed whenever they are not kept on concrete floors. Hence, nearly ½ or ¾ of the MDR (Minimum daily requirement) need be given. In addition, jaggery and rock salt are good sources of iron. Ferrous sulphate can be mixed in any standard mineral mixture so that each animal gets six to eight gms. This may be given in divided doses to avoid gastric problems like diarrhoea or constipation.

In acute anaemia, parental iron, Iron Dextran (IMFERON) will give very good results. The recommended dose is 0. 5 mg/kg BW. i.e One dose of Imferon, is sufficient for 100 kg. BW.

Feeding

The current ration given to the elephants is deficient in protein. Grams may either be soaked or wet ground or made into flour and cooked for easy digestion and quick results. The daily requirement of protein for elephants is 10-12% for mature elephants.

The sugarcane ration currently given to the elephants should be reduced to half the present quantity and must be substituted with grass or other roughages. Protein can also be given by adding soya, grams and/or lentils whichever is available at a rate of 2-3 kg/day/animal.

Feed additives

Vit. E requirement is 150 I.U/KW and Vit A requirement is 2000 I.U/Kg for elephants. Any commercial feed supplements like INDASOLE, VITABLEND etc. will be cheaper than using pharmaceutical preparations. These being fat-soluble vitamins, they may be given on a weekly basis after initial loading. Many eye problems point to Vit A deficiency being an issue. This could be due to green fodder, which is the main source of Vit A for animals, being unavailable. Indosol contains 1,00,000 Units of Vit. A. and hence 1 ml will meet the entire need for 50 kg. Body. Wt. of an animal. Initially Vit. A,D,E injections, available locally can be given for immediate results, especially for animals that are having eye problems.

Water

Water must be given three times a day after work and rest, *ad-libitum*. There should also be a water tank to give a bath and scrub the elephants, which should be done at least twice a week. The tank can have the following dimension: 30x30x3 ft. with one feet sand at the bottom, and a slight gradient for drainage on one side.

Foot lesions

All elephants be given a footbath in 1% formalin (250ml of 40% commercial preparation in 10 litres of water) for one hour. This should be followed by the application of Gentian Violet solution or Castellanis paint. The nails should not be rubbed with stone but with a brush. Toe-nail cracks should be cleaned and dusted with antiseptic powder like Nebasulf or Sulphanilamide.

Opacity of the eye

Elephants that are already totally blind may never regain their vision in spite of treatment. Cases with early signs of cataract could be treated with

two ml of Placentrex, administered subconjunctivally, initially for five days daily and then subsequently 5-10 times on alternate days as the case may be.

Topically, Cinneraria maritime (Homeopathic) or any antibiotic eye drops (Soframycin, Pyrimon, etc.) could be used. Ointments will be difficult to apply. Since most of the eye problems are attributed to vitamin A deficiency, 6-8 ampoules of vitamin A preparations like Prepalin Forte initially, and subsequently oral preparations like Rovisol, Vitablend etc. could be tried.

Abscesses and wounds

Abscesses should be drained after making two openings, one of which should be at the dependant part. After drainage, the abscess should be filled with triple sulph (Zinc sulph, copper sulph & Mag sulph in equal proportion.) It will take anything from eight to ten days for the thick pyogenic membrane to come off. The cavities must be packed with medicated gauze after this. The medication could be initially Triple Iodine, then triple sulph. It may be alternated with Mag sulph gauze. Once signs of healing become evident, antiseptic powder could be used. "Healing dust" with Zinc oxide can also be tried.

Broken tusks

The pus accumulated in the pulp cavity should be drained and sprayed with "Topicure" spray or anything similar. Cotton sprayed with Topicure can be pushed in to the cavity and dressed on alternate days. Also, parental antibiotics (Dicrystacin LA for 500 Kg of BW) are imperative in most cases.

Prescription

For worms:

1. Mebendazole or Albendazole:3-4 mg/kg
2. Oxyclonazide: 1 gm/300kg by wt.
3.Liver stimulants (Livovet, Teffroli, Liv-52) 10-15 tabs/day for 1 month

Most of the animals have mixed infections and hence both strongyles and amphistomes have to be treated.

Supportive treatment:

Injections:

i. Hermin (hydrolysed protein-amino acids)	200 ml 2-3 bot.
ii. Hivit	2-3
iii. Calborol	1-2
iv. Dextrose 10% (i/v)	10-20 bot., twice wkly

Being hypertonic, provide drinking water after injection.

Oral:

Astymin Forte caps	15-20 bds
Fifol caps	30-40 bds
B complex Forte caps.	30-40 daily
Sharkoferol	450 gm daily for 15-20 days.

5. RECOMMENDATIONS

1 Comprehensive Elephant Management Program: The elephants in Jaipur need a comprehensive management strategy. Every animal that comes to Jaipur should conform to these management guidelines. The guidelines have to be developed simultaneously with the development of the proposed Elephant Village in Jaipur.

Responsibility: Elephant owners and Rajasthan Government (Forest and Animal Husbandry Departments)

2 Elephant village: The Tourism Department is apparently providing 53 acres for establishing an elephant village, solely for the purpose of housing these 100-odd elephants in Jaipur. It is imperative that a modern elephant management complex is built in consultation with experts on enclosure design. WTI can help in this regard.
Responsibility: Rajasthan government tourism department

3 Follow-up veterinary care: The veterinarians who attended the training camp have been informed of the follow-up veterinary care for every elephant examined. The local doctors who took interest during the camp should be supported and encouraged. Though this is ideal, the implementation of these recommendations could be ideally supervised by WTI veterinarians, once in three months.
Responsibility: WTI/HIS veterinarians and Rajasthan Animal Husbandry Department veterinarians

4 HIS as nodal agency: HIS could be made the local nodal agency for coordinating the health care of Jaipur elephants. A work plan for weekly veterinary support to the elephants by HIS vets, with support from WTI could be prepared.
Responsibility: HIS, Jaipur and WTI, New Delhi

5 Subsidy: The treatment can be subsidised at least to begin with. This could be done with the help of the Animal Husbandry Department, or/and NGOs like HIS and WTI.
Responsibility: Animal Husbandry Department and HIS

6 Involvement of stakeholders: The owners and mahouts should be involved in all aspects of elephant management: including the design of the Elephant Village, and the management plan.
Responsibility: Government of Rajasthan, Architects, WTI

7 Elephant insurance: The insurance authorities should insist on Modern Veterinary Care. They can ask for a health certificate from a Registered Veterinary Practitioner. The Insurance Company can even have a select list of veterinarians in hand, who they feel are qualified to issue the certificate.
Responsibility: Insurance companies

Appendix I

List of veterinarians who participated in the training camp

S.No	Name & Address	Phone
1	P.K. Mehrotra, Associate Prof., Apex Centre (Rajasthan Agr. Univ., Jaipur	419436
2	Kailash Mondhe, VPHO, Jaipur Nagar Viham	398515
3	Devendra Singh Rathore, Veterinary Hospital, Mansorover, Jaipur	554608
4	M.S. Kachhawa Adu., 147, Jadov Nagr A, Jaipur	761340 (98290-30324)
5	M.L. Parihar, J.D., Animal Husbandry Dept.	399619
6	Nihesh Patel, Animal Husbandry Dept., Rajasthan	NA
7.	R.S. Rathore, Animal Husbandry Dept., Rajasthan	NA
8	Prabhu Lal, Animal Husbandry Dept., Rajasthan	NA
9	Ahmad Hussain, Animal Husbandry Dept., Rajasthan	NA
10	Gashyam Swaraykar, Animal Husbandry Dept., Rajasthan	NA
11	Habib Rajpur, Animal Husbandry Dept., Rajasthan	NA
12	Ashi Muthi	623286
13	Shashank Manohar, V.O., Veterinary Polyclinic, Chetak Circle, Udaipur	0294-561386 (R); 0294-528608 (o)

S.No.	Name & Address	Phone
14	Gaurau Mehta, E-45, Jammuna Nagar, Sodala, Jaipur	0141-220941
15	M.S. Chaudhary, V.O., Jaipur Zoo, Jaipur	702797, 617319
16	T.M. Ramchandru, Asst. Director, Veterinary Polyclinic, Jaipur	373 237, 200535; 98290 69016
17	Vipiri Sharma, 883, Ram Nagar, Shashtri Nagar, Jaipur	NA
18	Devi Shankar Rajuria, HIS, Durgapura, Jaipur	760803
19	Y.P. Singh, V.O., Veterinary Polyclinic, Jaipur	363966 (R)
20	Kumar Udhakar	391574 (R); 703663 (O)
21	Pankaj Gupta (Sariska Project), V.O., Veterinary Hospital, Alwar	0144-330515
22	Lenin Bhatt	0141-357099
23	Vijay Pandey	0141-548354
24	Dharmendra Chharang	01590-20176
25	Kailash Hariramani	0141-606531
26	Vaishali Mittal	0151-526428
27	A.K. Saxena, Veterinary Polyclinic, Udaipur	0294-525025
28	Dinesh Kumar Rana, Veterinary Polyclinic, Ajmer	0145-429447
29	Emma Morris, HIS, Jaipur	760803
30	B.R.J. Mathur, Asst. Director, AH, Jaipur	513494
31	Gopal Singh, V.H., Gandhi Nagar, Jaipur	701725
32	Shashi Dhar, Senior Vet. Officer, Class-I Vet. Hospital, Amer, Jaipur	
33	Arvind Mathur, Veterinary Polyclinic, Jaipur	759228
34	R.S. Saxena, A.D, Jaipur	540139
35	M.G. Parihar, V.H., Sherera Bipanch	NA
36	Thaneshwar Saini, A.H. Department, Rajasthan	
37	G.S. Hatwar	NA

S.No.	Name & Address	Phone
38	Dhedanu, Amer	NA
38	B.B.L. Mathur, Senior Veterinary Officer,	211091 (R); 680379 (O)
39	Monca Lather, Deputy Director	370180
40	Vinod Ajmera, Additional Director,	370181 (O); 515151 (R)
41	Prem Dhinger	680379
42	Arun Kumar	520189
43	S.K. Magyam, Senior Veterinary Officer, Jaipur	761856

Appendix II

List of important topics covered in the Resource Material

S. No	Topic
1	Elephant facts
2	Care and management of elephant calves in captivity
3	Evolutionary history of elephants
4	Signs of health
5	Care of pregnant cow elephant
6	Musth in captive elephants
7	Handling musth elephants
8	Sensitive regions of elephant
9	Animal psychology applied to training
10	Feeding of captive elephants
11	Anaesthesia and surgical manipulation of elephants
12	Diseases reported in elephants
13	Problems in immobilizing and anaesthetizing elephants
14	Ageing in elephants
15	Requirements for aged elephants
16	Psychological restraint
17	Animal psychology applied to training
18	Estimation of body weight and evaluating body condition
19	Maintenance of individual elephant record
20	Normal physiological references in elephants

Appendix III

Animals examined during the camp

S. No.	Reg.No.	Name of Animals
1	64	Gulabkalin
2	94	Dilrupa
3	35	Dilrupa
4	129	Anarkali
5	6	Lakshmi
6	121	Chanchal
7	83	Rasheed (Makhana)
8	125	Phoolmala
9	128	Chambakali
10	114	Chanchal
11	39	Lakshmi
12	86	Lakshmi
13	26	Lakshmi
14	75	Lakshmi
15	126	Bijilee
16	136	Champa
17	5	Raja rani
18	130	Chambakali
19	116	Roopa
20	79	Ramu (Makhana)
21	29	Anarkali
22	41	Gulabkalin
23	108	Lakshmi
24	96	Kajel
25	11	Jangbahadur (Tusker)
26	119	Lakshmi
27	51	Lakshmi
28	122	Chanchal

S. No.	Reg.No.	Name of Animals
29	34	Lakshmi
30	133	Bholi
31	95	Madhumathi
32	36	Chanchal
33	65	Gulabkali
34	127	Basanthy
35	56	Lakshmi (Pseudo Pregnancy)
36	69	Lakshmi
37	87	Rani
38	54	Chambakali
39	57	Gulabkali
40	67	Kali
41	2	Lakshmiprasad (Single Tusker)
42	107	Bihithi
43	124	Chanchal
44	118	Poonam
45	43	Shyama
46	74	Anarkali
47	24	Amarbhahadur (Tusker)
48	9	Chanchal
49	92	Munna
50	38	Sundar
51	115	Chanchal
52		Madhumol
53	23	Chanchal
54		Lucky
55		Maina
56	81	Anarkali
57	27	Jamuna
58	132	Roopa
59	3	Masthana (Makhana)
60	93	Chamba
61	12	Chanchal

62	8	Roopkali
63	106	Rani
64	112	Lakshmi
65	135	Rajkali
66	134	Kali
67	20	Bijili
68	101	Rani
69	98	Lakshmimala
70	60	Rajbhahadur (Tusker)
71	105	Kajel
72	90	Roopkali
73	103	Rani
74	61	Gangaprasad (Makhana)
75	111	Champa
76	48	Moothy
77	137	Madumathy
78	85	Radha
79	89	Lakshmimala
80	66	Champakali
81	45	Lakshmi
82	30	Lakshmi
83	78	Champa
84	99	Moothy
85	77	Anarkali
86		Roopa
87	44	Bhola (Makhana)
88	117	Roopa
89	104	Guljan
90	68	Mayavathy
91	31	Reeka
92	49	Lakshmi
93	28	Lakshmi
94	14	Booly
95	15	Gulabkali
96	113	Munna
97	84	Madhumala
98	22	Chamba

Appendix IV

Data collected through clinical examination of each animal

1. Name of the animal
2. Owner's name
3. Age and sex
4. History of ……..
   - (a) Musth/breeding
   - (b) Disease (if any)
   - (c) Mud eating
5. Body condition
6. Buccal and ocular defects
7. Abscesses if any
8. Ankush injuries, skin tear
9. Foot pad condition
10. Skin condition
11. Tusk/trunk problems

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Impact assessment around the Jarawa Tribal Reserve, Middle and South Andaman Islands

Jumbo Express:
A Scientific Approach to Understanding and Mitigating Elephant Mortality due to Train Accidents in Rajaji National Park.

Elephant in Exile:
A Rapid Assessment of the Human-Elephant Conflict in Chhattisgarh.

Against the Current:
Otters in the River Cauvery, Karnataka

Silent Stranglers:
Eradication of Mimosa in Kaziranga National Park, Assam.

Living at the Edge:
Rapid Survey For The Endangered Ladakh Urial (Ovis Vignei Vignei) in Leh District of Ladakh Trans-Himalaya

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A Conservation Survey of the Phayre's Leaf Monkey (*Tranchypithecus Phayrei*) in Assam and Mizoram

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Protection of Olive Ridley Turtles (*Lepidochelys olivacea*) and their nesting habitats at Rushikuliya rookery, Orissa

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Understanding Human-Elephant Conflict in Maharashtra and adjoining areas

Crane Capital:
Conservation Strategy for Sarus Crane (*Grus antigone*) Habitata in Etawah and Mainpuri Districts, Uttar Pradesh.

Carnivore Conflict:
Support provided to Leopards involved in conflict related cases in Maharashtra

India at the International Whaling commission:
A Policy Document on India's Involvement in the IWC 1981-2003

Sighting Storks
Status and Distribution of Greater Adjutant Storks (Leptoptilos dubius)in the Ganga and Kosi River Floodplains near Bhagalpur, Bihar

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A census of Shahtoosh Workers in Jammu and Kashmir

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The Case of the 'Jogi Nath' snake charmers of India

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A Rapid Assessment of the Pir Panjal Markhor in J&K Distribution, Status and Threats

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Post-Tsunami Impact Assessment of Wildlife and their Habitats in India

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Wildlife Law:
A ready reckoner - A guide to the wildlife (Protection) Act 1972

Back to the Wild:
Studies in wildlife rehabilitation

Right of Passage:
Elephant corridors of India

Commentaries on Wildlife Law:
Cases, statutes & Notifications

D. **OTHERS**

Tiger Bridge:
Nine days on a bend of the Nauranala, by Barbara Curtis Horton

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